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# WESTERN NORTH CAROLINA:

AS A

# HEALTH RESORT.

BY

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The tendency of climatological science in our time is mainly directed to the study of the different constituents of climate, in order to ascertain thereby the fitness of special localities to certain classes of disease. The present sketch originated in the desire to make a small contribution to this department of our science, by furnishing a few data concerning a region heretofore unknown in its climatic relations to a great number of our people.

Western North Carolina, with the adjacent parts of Northwestern South Carolina and Northeastern Georgia, contains the southern extremity of the Appalachian chain, which extends in a continuous range to the north, through the whole eastern part of the Union. The highest elevations of the whole chain are found in its southern part, and especially in western North Carolina, thereby imparting special peculiarities of climate. The region which directly occupies our attention is bounded east and west by high mountain ranges, sloping gradually down, in the extreme north, to the southerly extension of the great Virginia valley, and declining very abruptly to the lowlands in the south. The boundary on the west is formed by the Unaka, Great Smoky, the Bald, Iron and Stone mountains, their highest ridge coinciding with the State line between North Carolina and Tennessee. To the east we find the Blue Ridge proper, with the highest elevations east of the Rocky Mountains; Black Dome being 6,707 feet above the level of the sea. The Blue Ridge in this section is the watershed between the Atlantic Ocean and the Mexican Gulf. All the streams having their sources east of the ridge empty into coast rivers, which flow, after short courses, into the Atlantic; whilst to the west all the water flows into the Tennessee river, a tributary of the Ohio, and finds its outlet through the Mississippi into the Gulf of

Mexico. Six principal streams break through the high western mountain barrier, among them the Tennessee river itself; and this peculiar feature contributes greatly to the variety of the different valleys, and enhances the beauty of the landscape. Prof. A. Guyot, of Princeton College, New Jersey, who explored this country some time ago, published a series of measurements he had taken. In this list, fifty-one mountains, rising over 6,000 feet above the sea-level, are mentioned.

Western North Carolina embraces an area of about five thousand square miles, and has its greatest extension from north to south. The length, from Virginia to Georgia, is about one hundred and eighty miles, while the breadth varies from twenty to fifty miles. The whole country is undulating, and perfectly level places, even of small extent, are rarely to be found. It can neither be called a valley nor a high plateau, as several high mountain-ranges, of which the Balsam Mountains are the most prominent, traverse it from northwest to southeast, and the spurs of which, extending all over the country, are the cause of its irregularity. The high barrier in the west, formed by the Great Smoky Mountains and their continuation, runs from southwest to northeast, and breaks the force of the northwest storms so frequently occurring, and so well known for their severity all over the eastern portion of our continent.

The geological character is, in general, of primary formation, which gives to the water a purity and softness highly appreciated by strangers. Springs are numerous, and greatly add to the richness of vegetation, which clothes all the mountains to their very summits. The mountains are all covered with timber, and a great variety of species presents itself to the eye of the botanist.* The soil is rich, and especially on the summits of the hills, a fact which, although surprising at first sight, is easily explained by the circumstance that the decay of leaves and vegetable matter is left undisturbed by the hand of man or the washing of rains. The clearness of the atmosphere, on bright,

*Prof. W. C. Kerr, State Geologist, says, in his report just published, that of species found in the United States, east of the Rocky Mountains, there are—

| | | | | | |
|---|---|---|---|---|---|
| Oaks, | 22, | and | 19 | in | North Carolina. |
| Pine trees, | 8, | " | 8 | " | " |
| Spruces, | 5, | " | 4 | " | " |
| Elms, | 5, | " | 3 | " | " |
| Walnuts, | 2, | " | 2 | " | " |
| Birches, | 5, | " | 3 | " | " |
| Maples, | 5, | " | 5 | " | " |
| Hickories, | 8, | " | 6 | " | " |
| Magnolias, | 7, | " | 7 | " | " |

sunny days, makes the mountains appear much nearer than they are in reality, and often deceives in estimation of distances.

If we enter into special investigation of the individual climatic factors, we have the longest series of observations made by the volunteer observer in Asheville, for the Smithsonian Institute, extending over a period of nearly eight years. This place is the principal town of Western North Carolina, being situated in the wide valley of the French Broad river, 2,250 feet above the ocean, and 250 feet above the river. It is located on an irregular plateau, extending from the base of the last spurs of the Black Mountain, and is the true representative of a mountain climate. The place, owing to its southerly location (35° 36′ north latitude), possesses the great advantage of being less subject to those great extremes of temperature under which the Eastern and Western States of the Union suffer so much. The importance of this subject may justify an explanation, by some details and figures, in proof of the correctness of my assertion. Asheville is famous for the coolness of its summers, the temperature of 90° being recorded only once in the whole period of eight years. The thermometer seldom rises above 85°, and the highest temperature in 1875 was 86°; 1874, 88°; and 8° the lowest point reached by the mercury in the Winter of 1874–75. The average summer temperature is 70.7°; and if we compare the extremes of heat and cold in cities having an equal or similar summer mean, the Chief Signal Office Report for 1874 furnishes us the following interesting data, for the period from October 1st, 1873, to September 30th, 1874:—

| Cities. | Average Summer Temperature. | Highest Summer Temperature. | How often Temperature above 90°. | Lowest Winter Temperature. | How often Temperature below 0°. | Range of Temperature for whole Year |
|---|---|---|---|---|---|---|
| Asheville, N. C.... | 70·7 deg. | 88 deg. | ..... | 8 deg. | ..... | 80 deg. |
| Sandy Hook, N. J. | 69·8 " | 93 " | 3 times. | 7 " | ..... | 86 " |
| Long Branch, N. J. | 69·8 " | 94 " | 5 " | 7 " | ..... | 87 " |
| Cleveland, Ohio... | 71 " | 96 " | 5 " | 8 " | ..... | 88 " |
| New York City... | 71·7 " | 93 " | 5 " | 4 " | ..... | 89 " |
| Detroit, Michigan. | 69·4 " | 97 " | 5 " | 0 " | ..... | 97 " |
| Chicago, Illinois.. | 72·2 " | 99 " | 16 " | —6 " | 1 time | 105 " |
| Denver, Colorado | 73 " | 102 " | 50 " | –11 " | 11 " | 113 " |
| Colorado Springs.. | 70·8 " | 101 " | 39 " | –17 " | 14 " | 118 " |
| St. Paul, Minn.... | 71·3 " | 99 " | 25 " | –23 " | 33 " | 122 " |

This table, which could easily be enlarged, shows in strong figures the uniformity of climate at Asheville. But places with even a lower summer mean than Asheville show a considerably

higher extreme, as we learn from the meteorological report of Professor G. T. Kingston for the Dominion of Canada for 1874. The whole number of stations was fifty-three, all of which have a lower summer mean than Asheville. Of these stations, twenty-six showed over ninety degrees temperature; and of twenty-eight stations in Ontario, twenty-one gave the same thermometric result, over ninety degrees. We would obtain a similar table in a contrary direction, by taking the winter mean of Asheville (37·8°) as a standard of comparison with other places of the same mean winter temperature. Let it, however, suffice to say that these observations are corroborated by the records of the different volunteer stations in Western North Carolina, as published in Professor Kerr's report. It can fairly be said that this region, and especially Asheville, has one of the lowest extremes of summer temperature, and that few places are found on the eastern side of the continent combining such coolness of summer with mild winters. Places of the same elevation show a still greater difference in our favor.

Another feature of interest presents itself in a comparison, during a long period, of the diurnal ranges of the thermometer in places at the same or higher altitude. As the Chief Signal Office Report for 1874 does not contain records of the maximum and minimum temperature at stations of a similar elevation, it is necessary to take stations which, though located higher, have the range during a full year recorded. In the following places, in Colorado, Dakota and Wyoming, the daily range of the thermometer over 20° has been calculated and placed in subdivisions of 5°, from 20° upward to 60°; and the same has been done for Asheville, for the years 1873 and 1874. (See table on page 5.)

This table needs no commentary, but speaks for itself. Whilst the highest daily range at Asheville was but once in two years over 40° (and then only 41°), Colorado Springs shows the same range thirty-three times in less than one year: Denver twenty-nine times in 1873, and thirty-one times in 1874, etc., and both run in decreasing number up to the high range of between 55° and 60°. It is here necessary to state that in the extremely dry regions of Colorado and the Western territories crossed by the Rocky Mountains, the cold air and change of temperature are much less perceptible; an observation which, to a certain extent, is also made here.

| Diurnal Range, in degrees, F. | NUMBER OF OCCURRENCES OF THE DIURNAL RANGE IN | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Colorado Springs, 1874, 10 mo. and 6 days. | Denver, Col. | | Fort Sully, Dakotah. | | Cheyenne, W. T. | | Asheville, N. C. | |
| | | 1873 | 1874 | 1873 | 1874 | 1873 | 1874 | 1873 | 1874 |
| 20°–25° | 46 | 58 | 55 | 74 | 70 | 66 | 63 | 46 | 30 |
| 25°–30° | 47 | 59 | 68 | 49 | 80 | 71 | 83 | 28 | 18 |
| 30°–35° | 52 | 59 | 77 | 43 | 51 | 67 | 63 | 14 | 14 |
| 35°–40° | 72 | 55 | 60 | 47 | 36 | 34 | 50 | 1 | 4 |
| 40°–45° | 33 | 29 | 31 | 18 | 16 | 16 | 26 | .. | 1 |
| 45°–50° | 19 | 6 | 11 | 4 | 6 | 4 | 5 | .. | .. |
| 50°–55° | 3 | 1 | 1 | .. | 1 | .. | .. | .. | .. |
| 55°–60° | 2 | .. | 1 | .. | .. | .. | .. | .. | .. |

Records of the other climatic elements in this region are scarce, and the fullest are those of the rain-fall, and its amount in inches for a period of several years, in Professor Kerr's report. We here learn that of eighteen stations in the whole State, only one has a lower amount of rain-fall than Asheville, viz: Greensboro, which shows but 19.9 inches, whilst Asheville has 39.4, or as a mean of 8 years, 40.2 inches. All stations of Western North Carolina have considerably more, ranging from 48.5 to 72.8 inches; the average for the whole western division being 58.2 inches. Our place, therefore, shows a very favorable ratio in comparison with the surrounding country and the State in general. The pressure of vapor, its weight, the absolute humidity, have, to my knowledge so far, not been measured; but the observations of daily life, the rapid drying of roads after a rain-fall, the conservation of meat hanging in the open air, etc., indicate but a small amount of moisture suspended in the air. The unusual rain-fall and general atmospheric conditions of this summer deprived researches into the relative humidity (saturation at 100) entirely of their value. Instituted only a short time, the mean of three observations for the time at which patients generally move about in the open air, viz: noon, 2 and 4.15 P. M., give for the month of October 50·2° and for the whole month 64° relative humidity.*

If after these considerations, we regard the climate of this section as a whole, we find all the theoretical requirements of a mountain climate existing in their proper relation. It is not here in place to urge in detail the beneficial effects of elevated regions on the large class of sufferers from pulmonary phthisis.

*NOTE: The average relative humidity for the first quarter of 1876 was 59.8°.

But as it is not yet known and universally acknowledged that the decrease of the occurrence of phthisis is greatly dependent upon elevation above the sea-level, and the consequent lower barometric pressure of the atmosphere, it will not be out of the way to quote, from the extensive literature of this subject, some few works which may aid those wishing to make investigations in this direction.* The practical application of these theoretical researches, viz., the treatment of consumptives by a protracted sojourn in elevated places, is being, and has been for some time past, carried out on a large scale in Europe and other parts of the globe. According to a recent compilation, there are now 123 mountain resorts in existence in Europe, at elevations from 1,500 to 4,000 feet and over. Our section has a great advantage over many European resorts, which are, without exception, situated in more northerly latitudes. Although phthisis is observed in countries with most heterogeneous temperature, it will nevertheless be in many cases desirable to send such patients to a locality of moderate thermometric range and extremes; as sudden changes often prove causes of fresh colds or intercurrent affections. In the South the rays of the sun have greater power; insolation, generally more powerful in the mountains, is increased, and affords a most valuable medium for the invalid in winter. He is thereby enabled to move about, or to sit in sheltered sunny places on winter days, and enjoy without injury the salubrious influence of fresh air. The relations of ozone in the air have not been as yet investigated, but all conditions for its production are present—as abundance of vegetation, of water

* *Fuchs:* Medizinische Geographie, 1853. *Muehry, A.:* Climatologische Untersuchungen, oder Grundzuege der Climatologie; Leipzig und Heidelberg, 1858. *Muehry, A:* Climatographische Uebersicht der Erde: Leipzig und Heidelberg, 1862. *Jourdanet, D:* Les Altitudes de l'Amérique Tropicále; Paris, 1861. *Jourdanet, D.:* L'air Raréfié: Paris, 1862. *Jourdanet, D.:* Le Méxique et l'Amérique Dyricale; Paris, 1864. *Hirsch, August:* Handbuch der Historisch Geographischen Pathologie, II Band; Erlangen, Fr. Enke, 1862-1864. *Smith, Archibald:* Climate of the Swiss Alps and of the Peruvian Andes compared; Dublin *Journal*, 1864, 1866. *Schnepp, B.:* Études sur les Climats, etc.; Paris, 1865. *Weber, Hermann:* On the Influence of the Alpine Climates on Pulmonary Consumption; British *Medical Journal*, 1867, vol. II. *Weber, Hermann:* On the treatment of Phthisis by Prolonged Residence in Elevated Regions; Transactions of the Medical and Chirurgical Society in London, vol. LII, 1869. *Kuechenmeister, Fr.:* Die Hochgelegenen Plateaus als Sanatorien fuer Schwindsuechtige; Wien, 1868. *Kuechenmeister, Fr.:* Ueber das Vorkommen der Lungenschwindsucht, etc; Dresden, 1869. *Spengler:* Die Landschaft Davos; Basel, 1860. *Drysdale, Charles R:* Alpine Heights and Change of Climate in the Prevention and Treatment of Pulmonary Consumption, London, 1869. *Lombard:* Les Climats des Montagnes; third edition, Génève, 1873. *Biermann, A.:* Hochgebirge and Lungenschwindsucht; Leipzig, Otto Wigand, 1874. *Scrivener:* On the Bolivian Andes; in several journals. By *Myself:* Nature and Curability of Pulmonary Phthisis; Richmond and Louisville *Medical Journal*, July, 1875. Altitude and Climate in the treatment of Pulmonary Phthisis; Transactions of the Medical and Chirurgical Faculty of Maryland, 1875.

electric tension and great evaporation. The purity of the air is another element of value in mountain districts. Low temperature, dryness, greater amount of ozone, are not favorable to the development of micrococci and bacteria; and the processes of putrefaction, fermentation and moulding are diminished or entirely absent. Diseases originating from their products do not exist, or cannot gain a foothold; no manufactories contaminate the atmosphere, and the patient inhales with delight the pure air. The mountain climate in general exerts a tonic influence over the whole system, induces greater activity of all organs and functions, and imparts strength. The desire for food is increased, and the latter better digested and assimilated. The psychical influence of the beauty and grandeur of nature has undoubtedly a beneficial effect on the depressed human mind.

Before ventilating the question as for which diseases this climate can be advised, it is necessary to state that one great attraction of the future is not developed at all at present. Western North Carolina has the greatest abundance of mineral springs, which, with very few exceptions, have never been analyzed, and the medical use of which has never been thought of or attempted. Without having paid, so far, special attention to this point, I counted over half a dozen such springs in the immediate neighbourhood of the town of Asheville. There are alkaline, chalybeate, and sulphur springs to be found, but none of them are properly set or utilized. Five miles from this town is a good and abundant sulphur spring, which, many years ago, attracted a great number of visitors. A large hotel, capable of accommodating two hundred guests, was erected, and the grounds nicely laid out; but since the house was destroyed by fire, in 1860, the springs and property are neglected and unused. The warm springs in Madison county, thirty-six miles west of Asheville, are the only ones now extensively visited, and have proved beneficial in many cases to which they are adapted. There is no doubt that, as soon as attention is once properly directed to this subject, these resources will soon be developed and made available to the sick.

Although, for sometime to come, we must depend solely on nature's abundant gift of climate, we find many instances in which this proves efficacious and beneficial. Among constitutional disturbances, we may mention nervous prostration from overwork, insufficient nutrition, anæmia after severe sickness, chlorosis, dyspepsia, and malarial cachexia. It has already

been mentioned that improvement in digestion and assimilation takes place here as a rule, and my own experience corroborates the assertion of other observers. I would here observe, withou further specifying the effect of the climate on such patients, that a certain amount of strength must still be left them, in order that they may obtain relief. The individual organs should not be so debilitated or degenerated that the result of treatment will be prevented by the impossibility of stimulating their functions. Malaria and its consequences are unknown here, and a recovery from its manifold sequelæ can safely be expected.

Finally, this region has an important value in relation to diseases of the respiratory organs, and amongst them more especially to pulmonary phthisis. Patients for whom climatic treatment in elevated regions is indicated, find here all the necessary conditions in their fullest extent. The best results are attained in defective development of the thorax in young people, either hereditary or brought about by disease, or too rapid development. This is the frequently occurring so-called atony of the lungs, with want of full breathing, and mechanical predisposition to disease of the apex of the lungs. To these patients climatic treatment almost invariably offers a cure, and even a few months of such treatment, under proper control, suffice to produce better complexion, greater strength, more energy in the performance of the functions in general, and increased capacity of lung. Phthisical catarrh of the apices and chronic infiltrations of the lungs are also proper conditions for treatment by mountain climate; but the latter should not be so extensive as to make breathing rarefied air dangerous, or to prevent the energy necessary for constitutional reaction in general. The same may be said of cases where the breaking down of tissues has already set in. The selection of such patients should be made with care. Taken as a whole, the expression may be allowed that our region will be found advantageous for the majority of those cases which are suited for treatment in elevated regions, uniting as it does, by its situation, by far the greatest number of the desiderata of a mountain climate.

The accommodations for the reception of invalids are slowly but steadily increasing. There are now three hotels and a number of boarding houses in town for visitors, besides the Mountain Sanitarium, especially designed for the treatment of invalids. Asheville will be, before long, the center of three railroads, and there is no doubt but that a bright and promising future is in store for this beautiful, sunny country.

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